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ORIGINAL ARTICLE

DORSAL DISTRIBUTION OF HAIR ON THE PHALANGES OF HAND IN A SAMPLE OF MEDCHAL TOWN

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ABSTRACT: Mammals are hairy, but humans have shed most of it during evolution and became naked apes. Among humans men are supposed to be hairier than women. The hair pattern on the dorsal aspect of the hand is genetically and hormonally governed. This study has been conducted in Nigerians[1] and Indian Tribes. In association with the importance of this feature 124 subjects (63 males and 61 females) between the ages of 20 and 40 years were randomly selected from Medchal town, R. R. Dist, Telangana. The dorsal surface of the hands and digits of subjects was physically inspected for hair distribution. Observations were recorded and subdivided into gender and phalangeal hair patterns. Relation between gender and patterns was assessed by Fisher's exact test. Results show hair distribution patterns 1-2-3-4-5 (10%), 2-3-4-5 (54%), 2-3-4 (3%), 3-4-5 (16%), 3-4 (9%). One percent had no hair in there proximal phalanges. None of the females had hair on their middle phalanx. There was complete absence of hair on the distal phalanges. The pattern "3-4 "shows a significant female preponderance.

KEYWORDS: Hair, Phalanges, Fisher Exact test.

INTRODUCTION: In humans, hair is common. This is a special cherished feature in females. Hair is a filamentous keratinized accessory structure of the skin which is present over almost the entire body surface[2] (Jungueira and Carneiro, 2005). It is derived from the epidermis and assists in thermoregulation and protection.[3] (Harrison and Davis, 1999). It has sensory innervations and subserves various roles in social communication. It is also used for diagnostic purposes[4] (Szalai et al., 1999).

A wide range of familial and racial differences are seen in the distribution of hair on the dorsal surfaces of middle segments of fingers.[5] (Nasir et al., 1995).

The first study on phalangeal hair patterns was carried out in 1921[6] (Hatiboglu, 1983). Subsequently many researchers have investigated the racial differences in distribution of hair on the dorsum of fingers.[1,6,7,8,9] (Saldanha and Guinsburg, 1961; Dutta, 1963; Brothwell and Molleson, 1965; Singh, 1982; Hatiboglu, 1983).

More number of hairs on fingers is considered as a dominant trait and it follows the Mendelian Law in its mode of inheritance. Middle segmental hair is governed by a set of five alleles, having increasing dominance in phantasies A°, A1, A2, A3 and A4[10,11](Bernstein and Burks, 1942; Bernstein, 1949). The subscripts correspond to the number of digits the alleles cause to be affected. Hence, a person without middle segmental hair would be considered as having A° phenotype, having A° A° genotype.

Variations of hair are genetically determined and the complete absence of mid-phalangeal hair is a recessive trait 12(Dutta, 1965) and varies from different ethnic groups, race and nationality.

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THE AIM OF THIS STUDY: Is to evaluate the different patterns and frequency of hair distribution on the phalanges of hand in a sample of medchal town.

Population	Percentage with hair	References
Yoruba	0.2	Olabiyi et al (2008)
Calabar (Nigeria)	21.0	Singh (1982)
Kanuris and Baburs(Nigeria)	25.2	Mbajiorgu et al (1996)
Ethiopia	25.6	Batmiriam (1962)
Japan	36.8	Matsunaga (1956)
Tibet	44.3	Tiwari &Bhasin (1969)
Bengal (India)	49.0	Dutta (1963)
Turkey	49.0	Hatiboglu
Britain	70.2	Brothwell & Molleson(1965)
America (white)	70.4	Danforth

Table 1: Previous studies

MATERIALS AND METHODS: 124 subjects aged between 20-40 years were used for the study, (63 males and 61 females). All the subjects and their parents were natives of medchal town. Those with skin diseases and permanent injury scars (burns) were excluded from the study. Informed consent was obtained from each subject. The hairs were counted with hand-lens for all fingers and recorded. Data was analyzed by using Fisher's Exact Test. The p values <0.05 were considered significant.

The hair distribution patterns were divided into 8 groups for easy Analysis:

- Proximal phalangeal hairs.
- Those with hairs on 1st, 2nd, 3rd, 4th, 5th, fingers.
- Those with hairs on 2nd, 3rd, 4th, 5th fingers.
- Those with hairs on 2nd, 3rd, 4th fingers.
- Those with hairs on 3rd, 4th, 5th fingers.
- Those with hairs on 3rd and 4th fingers.
- Those without hairs.
- Middle phalanx.
- 3rd, 4th and 5th fingers.
- 4th finger only.
- Distal phalangeal hair.

RESULTS: Significant variations have been noticed in the distribution of hair in males and females. 3% of the subjects had hairs on digits 2-3-4, while 54% had on digits 2-3-4-5. 1% of the population had no hair on the proximal phalanges. Hair was completely absent on the distal phalanges of all subjects. Statistically pattern 3-4 had significant difference in relation to sex. No significant difference was observed in other patterns (Table 2).

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Sl. No.	Group	Total No.	Male	Female	Office	Field
1	2-3-4-5	63	33	30	36	27
2	3-4-5	20	9	11	8	12
3	2-3-4	4	2	2	1	3
4	3-4	12	3	9	3	9
5	4	1	1	-	1	-
6	1-2-3-4-5	14	11	3	3	11
7	4-5	2	-	2	2	-
8	3	4	2	2	-	4
9	3-5	1	1	-	-	1
10	1-2-3-5	1	1	-	-	1
11	Without hair	2	0	2	-	2

Table 2: Hair Distribution Pattern in relation to Job Type and Sex

The phalangeal hair pattern was divided in to groups according to presence of hair on each phalanx. The phalangeal hair patterns were grouped into 1 to 11. Most common pattern is seen in group 1 (2-3-4-5) (54%) in which hair was present on the 2nd, 3rd, 4th hand 5th phalanges. It was followed by group 2 (3-4-5) with 16% of the sample size while the least common patterns were group 5 (4), group 9(3-5), and group 10 (1-2-3-5) according to table2.

	PHALANGEAL HAIR DISTRIBUTION PATTERNS											
Group	**2-3-4-5**	**3-4-5**	**2-3-4**	**3-4**	**4**	**1-2-3-4-5**	**4-5**	**3**	**3-5**	**1-2-3-5**	**0**	**Total**
Male Office Workers	15 13%	5 4%	- -	2 1%	1 1%	- -	- -	- -	- -	- -	- -	23 19%
Female Office Workers	21 18%	3 2%	1 1%	1 1%	-	3 2%	2 1%	-	-	-	-	31 25%
Male field Workers	18 15%	3 2%	1 1%	2 1%	-	11 9%	-	2 1%	1 1%	1 1%		39 31%
Female field Workers	09 8%	9 8%	2 1%	7 6%	-	-	-	2 1%	-	-	2 1%	31 25%

Table 3: Job Type, Sex, and Hair Distribution

Table 3 shows that the difference between both sexes is not significant i.e.2%. The most common pattern for both sexes is 2-3-4-5 while the least common for male are 4, 3, 3-5, 1-2-3-5 and for female is pattern 3, 3-5, 1-2-3-5.

Density per cm	0	1	2	3	4	5	6	7	8	9	Total
No. of people with X density on the right phalanges	6	8	22	18	7	4	-	-	-	-	65
No. of people with X density on the left phalanges	10	11	13	12	10	1	2	-	-	-	59

Table 4: Type and Density of Field Workers.

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Density per cm	0	1	2	3	4	5	6	7	8	9	Total
No. of people with X density on the right phalanges	0	5	-	16	18	11	-	1	-	-	51
No. of people with X density on the left phalanges	2	6	7	29	17	6	6	-	-	-	73

Table 5: Job and Density of Office Workers

Results in table 4 show no significant variation between the density of the phalangeal hair on the right and left hands of field workers given that left: right is 59:65. Table 5 shows a significant difference in the density of phalangeal hair on the right and left hands of office workers. The density of the left phalangeal hair is greater than the right hand, given that, left:right is 73:51. These variables are expected because differentials have been found among the types of phalanges used for particular forms of job and depending on regularity of use.

	Group	Field worker	Office worker
Density	Right>Left	21	18
Density	Left>Right	34	25
Density	Left=Right	15	11

Table 6: Variation in Density of Right and Left Hands in Field and Office Workers

Table 6 Shows that the greater percentage of the population (47.5%) had left phalangeal hair density higher than the right hand.

DISCUSSION: Hair have always been present on proximal and absent on distal segments of fingers in most of the populations. Previous researches indicate that individuals tend to have more hair on the proximal phalanges in both sexes followed by middle and none in the distal phalanges. In the present study the highest percentage of hair distribution was observed in the proximal phalanges, males 100% and females 99%. This finding is consistent with observation in previous studies.

Statistically pattern 3-4 has shown significant (<0.005) difference in relation to sex. There was no significant difference in all the other patterns.

The commonest type of hair pattern for this ethnic group was the 2-3-4-5 finger pattern, while the least was 3rd, 4th, 3-5 and 1-2-3-5 finger patterns.

Prolonged wet work such as bricklaying, block making, laundry, hairdressing, machines and all types of fieldwork predisposes to sparse phalangeal hair. It was recommended that people engaged in these kinds of jobs should cultivate the habit of wearing hand gloves to protect their phalangeal hair, a very important cold receptor.

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